Nneka Ezenwa Chiazor
Executive Director
Federal Regulatory

1300 I Street, NW
Suite 400 West
Washington, DC 20005
(202) 515-2466
(202) 336-7922 (fax)
nneka.chiazor@verizon.com

September 11, 2013

VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

Re: California Chapter of the National Emergency Number Association Letter of August 12 2013, *Wireless E911 Location Accuracy Requirements, PS Docket No. 07-114*

Dear Ms. Dortch:

In its August 12, 2013 letter to Chairwoman Clyburn, the California Chapter of the National Emergency Number Association ("CALNENA") asserted that Verizon Wireless and four other wireless carriers are not providing Phase II Enhanced 911 service to a group of five Public Service Answering Points ("PSAPs") in California, by not delivering Phase II data as required by Commission rules.[1] As discussed below, however, CALNENA's report does not measure carriers' delivery of Phase II data under the Commission's rules. Rather, CALNENA measured the degree to which the PSAPs *retrieved* the location data that carriers have made available to them. Verizon Wireless' data further indicates that it delivered Phase II data for the five PSAPs 91%-95% of the time, in full compliance with Commission rules and long-established technical standards, and that the five PSAPs did not attempt to retrieve available Phase II data for a significant percentage of those 911 calls.

INTRODUCTION/SUMMARY

Verizon Wireless' commitment to developing and deploying reliable E911 ("E911") solutions for its customers is evidenced in its industry-leading deployment of highly accurate

[1] *See* Letter from Danita L. Crombach, ENP, President, The California Chapter of the National Emergency Number Ass'n, to Chairwoman Mignon Clyburn, Federal Communications Commission, WT Docket No. 07-114, dated Aug. 12, 2013, Attachment at 1, 3-7.

Assisted-GPS ("A-GPS") E911 location technology, and most recently in its voluntary launch of text-to-911 service, and it has a long history of working constructively with national public safety organizations, local PSAPs, and the Commission in promoting those objectives. Given this commitment to its customers and public safety, Verizon Wireless took CALNENA's allegations seriously, and initiated a review and analysis of Phase II E911 data from its solution vendor in California, Intrado, and met with CALNENA and its consultant to better understand CALNENA's study and the data collected by its consultant and obtain a common understanding of the facts.

Verizon Wireless will continue to work cooperatively with CALNENA in this regard. Nevertheless, Verizon Wireless has determined that CALNENA mistakenly asserts that its data indicate that carriers are not appropriately delivering Phase II information. Simply put, CALNENA measured the extent to which PSAPs have *retrieved* the location data that carriers have made available to them during the course of a 911 call – *not* whether carriers have delivered Phase II data in accordance with Commission rules and established technical standards. As a result CALNENA's report significantly understates the percentage of E911 calls for which Verizon Wireless makes Phase II location information available to these PSAPs. Specifically:

- Verizon Wireless' E911 call data compiled by Intrado demonstrate that, for the final six months covered by the CALNENA report, Verizon Wireless provided Phase II location information for a very high level – *91% to 95%* – of all completed 911 calls for the five counties covered by the CALNENA report. Verizon Wireless also confirmed that it has met its obligations under the Commission's rules for making Phase II data available to the California PSAPs.

- The reason for the variance between Verizon Wireless' data and CALNENA's data that show lower percentages appears to be that CALNENA's consultant only looked at the percentage of E911 calls for which Phase II data was the last location *retrieved* by the PSAP's system during the calls, and not the percentage of E911 calls for which Phase II data was provided by the wireless carriers. This appears to be the basis for CALNENA's assertion that carriers are not delivering Phase II location data "with the 911 wireless call" to the five PSAPs.

- Importantly, under the E911 technology standard deployed by the five PSAPs, carriers do *not* deliver Phase II location data to the PSAP's call taker equipment "with the call." Under the established (and Commission-approved) NCAS Wireline Compatibility Mode ("NCAS") E911 solution, the PSAP itself is responsible for *retrieving* the Phase II data from the "Mobile Positioning Center" ("MPC"), a designated point at the carrier's network, via a query or "bid" to the PSAP's own ALI database. This enables the *PSAP's own network* to complete the delivery of the Phase II data to the 911 call taker's equipment. In other words, while wireless carriers "push" Phase II location data to the MPC, the PSAPs must "pull" that data in order for them to have access to it on call-takers' screens.

- PSAPs perform an initial bid for available location information when the voice call first arrives at the PSAP. But because of the recognized time needed to generate Phase II location data in a mobile environment, particularly in challenging terrain that challenges carriers' radiofrequency-based location technologies, PSAP best practices call for PSAPs to re-bid the MPC within 15-30 seconds if their initial bid does not yield Phase II data when the wireless 911 call first arrives. Thus, where Verizon Wireless is able to provide a Phase II location to the MPC within its average 12-15 second period, a re-bid would normally be able to retrieve the information.

- Data from Verizon Wireless' vendor, however, indicate that the five PSAPs performed a re-bid for *less than one-half* of all 911 calls – and for the PSAP where CALNENA's data showed the lowest numbers, *less than 10%* of 911 calls. In short, it appears that the principal reason for the low percentages reported by CALNENA's consultant is that the PSAPs did not retrieve Verizon Wireless' Phase II data that was in fact available.

- Finally, Verizon Wireless has diligently maintained and improved the location determination capabilities of its network and handsets to increase the probability that Phase II information will be available with the initial bid. That improvement is reflected in CALNENA's own data.

In short, Verizon Wireless' data demonstrates that it is meeting its E911 Phase II delivery obligations, and CALNENA's data does not indicate otherwise. A more detailed analysis follows below.

BACKGROUND

1. Wireless Carriers Are Obligated to Deliver Caller Location Data to the MPC, not the 911 Operator's Customer Premises Equipment

In requiring wireless carriers to provide E911 service, first Phase I (nearest cell site location and automatic number information (ANI) for callback) and then Phase II (the caller's latitude/longitude), the Commission has always recognized that PSAPs require switching and other systems that enable them to obtain wireless E911 service, and that delivery of the E911 data to the termination point at the 911 call taker's customer premises equipment is dependent on the PSAP's own E911 wireline network.[2] In 2002, the Commission affirmed (and applied to both Phase I and Phase II location information) a Bureau-level holding that wireless carriers'

[2] 47 C.F.R. § 20.18(j)(1) (Phase II obligation applies only insofar as the PSAP "is capable of receiving and utilizing the data elements associated with the service"); *In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems*, Report and Order and Further Notice of Proposed Rulemaking, 11 FCC Rcd. 18676, 18709 ¶ 63, n.119 (1996) (noting that PSAPs "must use [LEC-supported] switches, protocols, and signaling systems" and that "[o]lder analog systems may not have this capability"). .

E911 obligations "must account for the presence of the existing E911 Wireline Network … maintained by the ILEC and paid for by PSAPs through tariffs."[3] The Bureau explained that:

> When a wireless 911 call is made, the wireless carrier *must bring the wireless call, as well as the information about the caller (i.e., the caller's phone number and location) to the E911 Wireline Network for processing*. The E911 Wireline Network processes data received from the wireless carrier with the voice call.[4]

The Commission also clarified where and how wireless carriers may "bring" the Phase II location data to the PSAP's E911 Wireline Network for the NCAS data delivery method deployed by each of the five California jurisdictions. Specifically, the Commission in 2001 modified its rules to provide that where a PSAP had implemented NCAS, a carrier's Phase II deployment obligation would be triggered provided that the PSAP had timely requested "an additional upgrade to the ALI database *so that it will query the [MPC] at the appropriate time to acquire the Phase II latitude/longitude data*."[5] As a PSAP's implementation of the NCAS ALI database upgrade – including the MPC bid function – *compels* Verizon Wireless to provide Phase II service, the Commission necessarily implied that a carrier meets its Phase II data delivery obligations in an NCAS system by delivering the data to the MPC.

The Commission's decisions thus confirm that a wireless carrier's delivery of Phase II data to the MPC under the NCAS method is a valid means of complying with Phase II obligations. And the NCAS method specifically includes the PSAP's bid function to retrieve the Phase II data from the MPC – i.e., the "bid" and "re-bid" procedures described below that explain the seeming disparity between CALNENA's data and Verizon's.

2. PSAPs' NCAS Method Requires Them to Retrieve the Phase II Location Data from the MPC.

While the voice portion of a 911 call is typically routed to the ILEC selective router and usually arrives at the PSAP within about six seconds, legacy PSAP trunks typically lack capacity to handle the additional E911 data, so the E911 data is provided via a separate path.

---

[3] Letter from Thomas J. Sugrue, Chief, Wireless Telecommunications Bureau, to Marlys Davis, King County E911 Program Office, CC Docket No. 94-102, dated May 7, 2001, at 4 ("*King County Bureau Letter*") ("[A]n interpretation of [wireless carriers' E911 obligations] must account for the presence of the existing E911 Wireline Network, which is maintained by the ILEC and paid for by PSAPs through tariffs."), *aff'd on recon. In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Request of King County, Washington*, Order on Reconsideration, 17 FCC Rcd. 14789, ¶¶ 8-10 (2002) ("*King County Recon Order*") (affirming the *King County Letter* and applying its rationale to Phase II E911 location).

[4] *See King County Bureau Letter* at 4 (emphasis added).

[5] *See In the Matter of Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems, Petition of City of Richardson, Texas*, Order, 16 FCC Rcd 18982, ¶ 17 (2001) ("*Richardson Order*") (emphasis added); *see also* Letter from Thomas J. Sugrue, Chief, Wireless Telecommunications Bureau, to Kathleen B. Levitz, BellSouth Corp., Luisa Lancetti, Sprint PCS, and John T. Scott, III, Verizon Wireless, CC Docket No. 94-102, at 2 (WTB rel. Oct. 29, 2002) (clarifying the E2 interface "used to send a query from the ALI database to a [MPC] … requesting the transmission of location information back to the ALI database … is a software upgrade to the ALI database" and thus the PSAP's responsibility).

Transmitting the Phase II location under NCAS to the 911 call taker entails three sequential parts: (1) generating the location fix; (2) transmitting it to the appropriate point in the network for the PSAP to retrieve it; and (3) PSAP retrieval from the MPC via the bid and re-bid processes:

- *Generating the location fix*. Verizon Wireless's A-GPS solution first attempts to generate a location fix exclusively using GPS satellites, in which case a very precise Phase II fix can be obtained in as little as 5 seconds. When a caller is in a challenging environment (e.g. in an urban canyon, mountainous terrain, dense forests or inside a dense structure), the location server will attempt a Phase II fix via alternative, network-based location calculations, initially through a "hybrid" fix using a combination of A-GPS and network-based Advanced Forward Link Trilateration ("AFLT"), then through a purely network-based AFLT, and finally through other less accurate network-based determinations. OET Bulletin 71 calls for a calculation within 30 seconds, but in Verizon Wireless's experience the caller's location is calculated within 12-15 seconds on average.

- *Transmission to the MPC*. Once the fix is generated it is transmitted to the third party vendor's Mobile Positioning Center ("MPC") for retrieval by the PSAP via a bid to its ALI Database, which, in turn, accesses the MPC. Verizon Wireless has directed its MPC vendors to designate only pure A-GPS, hybrid, and AFLT location fixes as more accurate Phase II information for the PSAPs to retrieve.

- *PSAP Bid and Re-Bid*. The 911 call taker's equipment will identify that the call is from a wireless phone and, if standard practices are followed, the PSAP will immediately initiate a "bid" to its ALI database that directs the ALI database to pull the available location information from the MPC. The initial location bid to the ALI database is generally performed at the same time that voice portion of the call is delivered to the PSAP call taker. A pure GPS-based location fix often will be available with the PSAP's initial bid, but because Verizon Wireless' average time to deliver a Phase II fix to the MPC is around 12-15 seconds, in most cases the PSAP will often receive the "Phase I" cell site/sector location first with the voice call, and thus will need to "re-bid" to obtain the more accurate Phase II location. Because of the acknowledged challenges of determining the caller's location in a mobile environment (as described above), there are many situations in which the Phase II location will not be available during the first bid. Thus, NENA's best practices recommend that a PSAP manually perform at least one re-bid approximately 15 to 30 seconds after the receipt of the initial location bid response.[6]

[6] *See* NENA, *Wireless Phase I &II Features and Functions Operational Information Document*, Doc. 57-501, § 3.2.8 (Jan. 20, 2003). APCO's Project LOCATE subsequently reaffirmed the value of the re-bid process, and recommended that PSAPs "rebid all wireless calls when the wireless caller is not able to provide a location, even if the call is initially presented to the calltaker as [Phase II]." APCO International, *An Assessment of the Value of Location Data Delivered to PSAPs with Enhanced Wireless 911 Calls*, Final Report, at 20-21, 24 (Apr. 2007) , http://www.apcointl.com/resources/apco-wireless-resources/project-38-locate.html (Effective Practice No. 380743); *see also id.* at App. A (text of ATIS Emergency Services Interconnection Forum (ESIF) recommendation on re-bid process, noting that "[i]f the time between the initial bid and rebid is sufficient, the location technology should have been able to locate the caller's position and it can be returned to the PSAP" and supporting manual rather than "automatic re-bids").

Thus, even where only cell site location is available for the first bid, in most cases a PSAP call taker following best practices should be able to retrieve the more accurate Phase II location with that re-bid.

VERIZON WIRELESS' PERFORMANCE

1. Verizon Wireless Delivered Phase II Service to the MPC in the Five California Counties Consistent with Commission Rules

Verizon Wireless has obtained from Intrado data as to its performance during the final six months of the period covered by the CALNENA report for the five covered PSAPs, including (1) the percentage of 911 calls on Verizon Wireless's network for which Phase II data was delivered to the MPC (provided next to the associated December 2012 figure from the CALNENA report in the table below for comparison purposes),[7] and (2) the extent to which data for the MPC serving those counties received re-bids from the five PSAPs.

PSAP Name (+ County)	CALNENA Dec. 2012	VZW July-December 2012
Bakersfield PD (Kern)	67%	94%
Pasadena PD (Los Angeles)	52%	95%
City and Co. of San Francisco Emerg. Ctr (San Francisco)	37%	91%
San Jose PD (Santa Clara)	64%	94%
Ventura Co. Sheriff's Dept. (Ventura)	64%	95%

This evidence confirms that Verizon Wireless delivers Phase II data with a very high yield of Phase II location data and is notable for several other reasons. It includes calls from non-service initialized handsets, handsets from subscribers and roamers that may not be A-GPS capable, and even some prank calls. These figures thus *understate* the degree to which Verizon Wireless complies with the Commission's rules. The figures also *include* calls from indoor locations, which are not counted for E911 compliance purposes.[8] Finally, as noted above, Verizon Wireless' figures are limited to more accurate A-GPS, hybrid, and AFLT location fixes; when a location fix is derived from the other less accurate techniques, Verizon Wireless has

[7] For each of the five PSAPs, CALNENA's disclosed percentages for Verizon Wireless cover December 2012 only, but CALNENA's report indicates that these numbers are similar throughout the July-December 2012 period.

[8] *See* 47 C.F.R. § 20.18(h).

directed its MPC vendors to make Phase I cell site location information available to the PSAP instead.

2. The California PSAPs' Re-Bidding Practices to Retrieve Phase II Information

Verizon Wireless has evaluated PSAP-specific initial bid and re-bid data from Intrado's MPC for the period of July 2012 through December 2012, specifically, the percentage of Verizon Wireless 911 calls for which the PSAP performed only an initial bid, versus the percentage of calls for which the PSAP performed one or more re-bids. That data shows that for a vast majority of 911 calls, each of the five PSAPs did not perform a re-bid for updated location.

As noted below, there are legitimate reasons why a PSAP may opt not to perform a re-bid. Nevertheless, in San Francisco for example, the Intrado data indicates that the PSAP performed re-bids for only 8% of Verizon Wireless 911 calls – notwithstanding that Phase II information is available to that PSAP for the overwhelming percentage of Verizon Wireless 911 calls, even in that city's challenging topography. The handling of a significant number of 911 calls without performing a re-bid to obtain Phase II location data would explain why the percentage of 911 calls for which Phase II data arrives at the 911 call taker's screen would be substantially lower than Verizon Wireless's highly successful rate of Phase II location transmission to the MPC, as well as the high number of 911 calls with Phase I location data, which always is provided as a default.

PSAP	Initial Bid Only	One or More Re-Bid(s)
BAKERSFIELD POLICE DEPARTMENT	64%	36%
PASADENA POLICE DEPARTMENT	70%	30%
CCSF EMEG CNTR-SFECD (San Francisco)	92%	8%
SAN JOSE POLICE DEPARTMENT	71%	29%
VENTURA COUNTY SHERIFFS DEPARTMENT	59%	41%

Verizon Wireless understands that in many cases the call-taker will not need to rebid a call to obtain precise location information. As a matter of protocol, 911 call takers will ask the caller to provide his or her location if possible and are usually successful – in those cases, there would be no need for the 911 call taker to initiate a re-bid. Similarly, many wireless 911 calls originate from "good Samaritans" in the same general location of an incident, and once the 911 call taker obtains the location from the earlier calls additional location information for later callers may be unnecessary. In each of those cases, though, the location would appear at the PSAP as "Phase I" location even when Phase II location may be available at the MPC.

Finally, Verizon Wireless expects that the overall improvement for the period covered by the report is attributable at least in part to its diligent efforts with our A-GPS vendor (Qualcomm) to improve the sensitivity of the A-GPS chipset (so it can obtain a location fix in more challenging locations) and to ensure that the cell data used for location calculation within

Verizon Wireless's control that can influence the speed and accuracy of Phase II location information are as accurate and up-to-date as possible. This work has significantly improved the ability to get a Phase II fix in most locations and decreased the time it takes to make the initial location fix available to PSAPs – a fact which may well be reflected in the CALNENA data.[9]

*****

Verizon Wireless remains committed to working constructively with the Commission and other stakeholders, and would be glad to meet with public safety, industry and Commission representatives to discuss the methods and practices it has utilized to improve its ability to make the initial Phase II location fix available to PSAPs, as well as ways it can contribute to improving PSAPs' own re-bid practices.

Sincerely,

[9] *See* CALNENA Letter, Attachment at 1 (showing the percentage attributed to Verizon Wireless at 43% in January 2008 and 57% in December 2012).